

Note: Final - Thursday May 14  
8-3 5-101

(8-10)

## 7.2: Multiplying and Dividing Rational Expressions

EX:  $\frac{2}{3} \cdot \frac{4}{5} = \frac{8}{15}$

$\frac{\overset{1}{\cancel{5}}}{\underset{3}{\cancel{6}}} \cdot \frac{\overset{2}{\cancel{4}}}{\cancel{5}} = \frac{2}{3}$

2.  $\frac{\overset{3}{\cancel{9}x^2}}{y} \cdot \frac{4y}{\cancel{3}x^3} = \frac{12\overset{1}{\cancel{x}^2}\overset{1}{\cancel{y}}}{x^3\overset{1}{\cancel{y}}} = \frac{12}{x}$

4.  $\frac{\overset{1}{\cancel{6}x^2}}{\underset{2}{\cancel{10}x^3}} \cdot \frac{\overset{1}{\cancel{5}x}}{\underset{2}{\cancel{12}}} = \frac{\overset{1}{\cancel{x}^3}}{4\overset{1}{\cancel{x}^3}} = \frac{1}{4}$

6.  $-\frac{\overset{1}{\cancel{9}x^3y^2}}{\underset{2}{\cancel{18}xy^3}} \cdot \frac{y^3}{1} = -\frac{\overset{2}{\cancel{x}^3}\overset{1}{\cancel{y}}}{2\overset{1}{\cancel{xy^3}}} = -\frac{x^2}{2}$

Ex: (p 442)

$$8. \frac{4x - 24}{20x} \cdot \frac{5}{x - 6}$$

$$10. \frac{x^2 + x}{8} \cdot \frac{16}{x + 1}$$

$$\frac{4x - 24}{\cancel{20x}_4} \cdot \frac{\overset{1}{\cancel{5}}}{x - 6} = \frac{\overset{1}{\cancel{4}}(\overset{1}{\cancel{x-6}})}{\underset{1}{\cancel{4x}}(\underset{1}{\cancel{x-6}})} = \frac{1}{x}$$

$$\frac{x^2 + x}{\cancel{8}_2} \cdot \frac{\overset{2}{\cancel{16}}}{x + 1} = \frac{\overset{1}{\cancel{x}}(\overset{1}{\cancel{x+1}})2}{\underset{1}{\cancel{x+1}}} = 2x$$

$$16. \frac{x^2 + 9x + 20}{x^2 - 15x + 44} \cdot \frac{x^2 - 11x + 28}{x^2 + 12x + 35}$$

$$\frac{\cancel{(x+5)}(x+4)}{\cancel{(x-4)}(x-11)} \cdot \frac{(x-7)\cancel{(x-4)}}{\cancel{(x+5)}(x+7)}$$

$$\frac{(x+4)(x-7)}{(x-11)(x+7)}$$

EX:

$$\frac{\frac{2}{3} \cdot \frac{5}{4}}{\frac{4}{5} \cdot \frac{5}{4}} = \frac{\frac{2}{3} \cdot \frac{5}{4}}{1} = \frac{2}{3} \cdot \frac{5}{4}$$

$$18. \frac{9y^4}{6y} \div \frac{y^2}{3}$$

$$20. \frac{7a^2b}{3ab^2} \div \frac{21a^2b^2}{14ab}$$

$$\begin{aligned} \frac{9y^4}{6y} \div \frac{y^2}{3} &= \frac{9y^4}{\cancel{6y}^2} \cdot \frac{\cancel{3}^1}{y^2} \\ &= \frac{9y^4}{2y^2} = \frac{9y}{2} \end{aligned}$$

$$\frac{7a^2b}{3ab^2} \div \frac{21a^2b^2}{14ab}$$

$$\frac{\cancel{7}a^2b}{3ab^2} \cdot \frac{14ab}{\cancel{21}a^2b^2}$$

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$$\frac{14\cancel{a^3}\cancel{b^2}}{9\cancel{a^3}b^4}$$

$$\frac{14}{9b^2}$$

$$22. \frac{(x+3)^2}{5} \div \frac{5x+15}{25}$$

$$26. \frac{(m-n)^2}{m+n} \div \frac{m^2-mn}{m}$$

$$28. \frac{x-3}{2-x} \div \frac{x^2+3x-18}{x^2+2x-8}$$

$$30. \frac{x+1}{(x+1)(2x+3)} \div \frac{20x+100}{2x+3}$$

### 7.3: Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator

Ex: (p 449)

$$2. \frac{x+1}{7} + \frac{6}{7}$$

$$4. \frac{3p}{2q} + \frac{11p}{2q}$$

$$6. \frac{8y}{y-2} - \frac{16}{y-2}$$

$$10. \frac{x^2+9x}{x+7} - \frac{4x+14}{x+7}$$

$$12. \frac{3y}{y^2+3y-10} - \frac{6}{y^2+3y-10}$$

$$18. \frac{6x^2}{2x-5} - \frac{25+2x^2}{2x-5}$$

## 7.4: Adding and Subtracting Rational Expressions with Unlike Denominators

Ex: (p 455)

$$2. \frac{15}{7a} + \frac{8}{6a}$$

$$4. \frac{4c}{d} - \frac{8d}{5}$$

$$10. \frac{5}{x-4} + \frac{4x}{x^2-16}$$

$$12. \frac{5}{y^2} - \frac{y}{2y+1}$$

$$14. \frac{15}{y-4} + \frac{20}{4-y}$$

$$16. \frac{5}{a-7} + \frac{5}{7-a}$$

$$18. \frac{-9}{25x^2-1} + \frac{7}{1-25x^2}$$

$$20. \frac{7}{x^2} - 5x$$

$$24. \frac{7}{2x-3} - 3$$

$$30. \frac{5x}{6} + \frac{11x^2}{2}$$

$$32. \frac{5x}{(x-2)^2} - \frac{3}{x-2}$$

$$36. \frac{6}{x} - 1$$

$$40. \frac{10}{3n-4} - \frac{5}{4-3n}$$

$$42. \frac{5}{(x+1)(x+5)} - \frac{2}{(x+5)^2}$$

$$44. \frac{x}{x^2-4} - \frac{5}{x^2-4x+4}$$

$$50. \frac{-1}{a-2} + \frac{4}{4-2a}$$

$$54. \frac{-7}{y^2-3y+2} - \frac{2}{y-1}$$

$$58. \frac{x+4}{x^2+12x+20} + \frac{x+1}{x^2+8x-20}$$

## 7.8: Simplifying Complex Fractions

Ex: (492)

$$2. \frac{\frac{1}{8}}{-\frac{5}{12}}$$

$$8. \frac{\frac{3}{4} - \frac{1}{2}}{\frac{3}{8} + \frac{1}{6}}$$

$$12. \frac{\frac{7}{10} - \frac{3}{5}}{\frac{1}{2}}$$

$$18. \frac{\frac{x}{2} + 2}{\frac{x}{2} - 2}$$

$$22. \frac{x - \frac{1}{2x+1}}{1 - \frac{x}{2x+1}}$$

$$28. \frac{3}{1 - \frac{4}{3}}$$

$$30. \frac{\frac{m+2}{m-2}}{\frac{2m+4}{m^2-4}}$$

$$34. \frac{2 + \frac{6}{x}}{1 - \frac{9}{x^2}}$$

$$38. \frac{\frac{2}{x} + \frac{x}{2}}{\frac{2}{x} - \frac{x}{2}}$$

$$40. \frac{\frac{4}{x} + \frac{x}{x+1}}{\frac{1}{2x} + \frac{1}{x+6}}$$